

CLAIMS

1. Antisense oligonucleotides phosphorothioate against Smad7 up to 21 nucleotides in length which comprise a portion of at least 10 nucleotides of the following sequence (SEQ ID No 2):

5 5'-GTXYCCCCTTCTCCXCYCAG-3'

wherein X is a nucleotide comprising a nitrogenous base selected from the group consisting of cytosine, 5-methylcytosine and 2'-O-methylcytosine and wherein Y is a nucleotide comprising a nitrogenous base selected from the group consisting of guanine, 5-methylguanine e 2'-O-methylguanine, provided that at least one of the nucleotides X or Y comprises a methylated nitrogenous base;
10 or the complementary sequence thereto.

2. Antisense oligonucleotides according to claim 1, wherein at least one nucleotide of the sequence is methylphosphonate.

15 3. Antisense oligonucleotides according to claim 2, wherein said at least one methylphosphonate nucleotide is placed either at only one of the 3' or 5' ends or at both 3' and 5' ends or along the antisense oligonucleotidic sequence.

4. Antisense oligonucleotides according to claim 2, wherein the methylphosphonate nucleotide is Y.

5. Antisense oligonucleotides according to claim 2, wherein the methylphosphonate nucleotide is X.

6. Antisense oligonucleotides according to claim 1, wherein at least one nucleotide of the sequence is a 2'-O-methylribonucleotide 5'-monophosphate.

7. Antisense oligonucleotides according to claim 6, wherein said at least one 2'-O-methylribonucleotide 5'-monophosphate is placed at only one of the 3' or 5' ends or at both 3' and 5' ends or along the oligonucleotidic sequence.

30 8. Antisense oligonucleotides according to anyone of the preceding claims wherein 2'-deoxyribonucleotides are replaced by the corresponding ribonucleotides.

9. Antisense oligonucleotides according to anyone of the claims from 1 to 8 having sequence (SEQ ID No 4):

35 5'-ZTXGCCCCCTTCTCCCXGCAZ-3'

wherein X is 5-methyl 2'-deoxycytidine 5'-monophosphate and Z is 2'-deoxyguanosine methylphosphonate.

10. Antisense oligonucleotides according to anyone of the claims from 1 to 8 having sequence (SEQ ID No 15):

5'-ZTXGCCCCCTTCTCCCXGCAZC-3'

5 wherein X is 5-methyl 2'-deoxycytidine 5'-monophosphate and Z is 2'-deoxyguanosine methylphosphonate.

11. Antisense oligonucleotides according to claim 1 having sequence (SEQ ID No 3):

5'-GTXGCCCCCTTCTCCCXGCAG-3'

wherein X is 5-methyl 2'-deoxycytidine 5'-monophosphate.

10 12. Antisense oligonucleotides as defined in claims from 1 to 11 for use in medical field.

13. Pharmaceutical composition which comprises at least one of the antisense oligonucleotides as defined in claims from 1 to 11 as active principle together with one or more pharmaceutically acceptable adjuvants and/or excipients.

14. Use of the antisense oligonucleotides as defined in claims from 1 to 11 for the preparation of a medicament for the treatment of the pathologies associated with Smad7 expression.

15. Use according to claim 14, wherein the pathologies associated with Smad7 expression are chronic inflammatory diseases.

20 16. Use according to claim 15, wherein the chronic inflammatory diseases are Crohn's disease and ulcerative colitis.